CIVIL AIM CONSULTANTS & ENGINEERS

(Building Geo-Tech & Highway Materials Testing Laboratory)

An ISO 9001-2015 Certified Company
NABL Accredited As Per ISO/IEC 17025:2017 Laboratory

Job No.: CACE/BBMP/SS/W.No.14/2021-22

Date: 27.01.2022

TEST REPORT

CLIENT	:	**Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.
AGENCY	:	**Sri. Shivalingaiah Satish,** Contractor, Bangalore.
NAME OF THE WORK	:	Improvements to drains and Providing Asphalting to roads at Bhuvaneshwari Nagara 9th and 10th Main Surroundings in Ward No.14 Bagalagunte, BBMP, Bangalore.
SAMPLE ID	:	Cement (Zuari OPC 53 Grade)
DATE OF MANUFACTURE		December - 2021
DATE OF TESTING		25.01.2022 to 27.01.2022
SAMPLES SUPPLIED BY	:	AGENCY

The results of the tests conducted on the cement sample are as follows:

Sl.No	Descriptions	Test Method as per IS	Test Result	Requirements as per IS: 269-2015
1	a) Initial Setting Time	IS-4031 (Part -5)	10 Minutes	Not Less than 30 Minutes
	b) Final Setting Time	IS-4031 (Part -5)	330 Minutes	Not More than 600 Minutes
2	Soundness	IS-4031 (Part 3) by the Le-Chatelier method	1 mm	Not more than 10 mm
3	Standard Consistency	IS-4031 (Part -4)	30.00 %	-

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ಬಾಗಲಗುಂಟೆ, ಬಿ.ಬಿ.ಎಂ.ಪಿ
ಬೆಂಗಳೂರು-560073

For CIVIL AIM CONSULTANTS & ENGINEERS

Authorised Signatory

No. 01, Satvika Nilaya, Opp. Widia Poorna Prajna School,
Ramaiah Layout, Nagasandra, Bangalore - 560 073.
Ph: 9591618639, GSTIN: 29CNWPD9510K1ZB, Email: civilaimconsultants@…

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Job No.: CACE/BBMP/SS/W.No.14/2021-22 Date : 27.01.2022

TEST REPORT ON FINE AGGREGATES (SAND)

Client : **Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.
Agency : **Sri. Shivalingaiah Satish,** Contractor, Bangalore.
Name of Work : Improvements to drains and Providing Asphalting to roads at Bhuvaneshwari Nagara 9th and 10th Main Surroundings in Ward No.14 Bagalagunte, BBMP, Bangalore.
Date of Testing : 27.01.2022
IS Code : IS 383:2016
: IS 2386 (Part 1):1963(RA 2011)
Material : Sand

Total Wt. of Aggregates in gms **1000**

Is Sieve Size in mm	Weight Retained (gm)	Retained Weight in %	Cumulative Retained Weight in %	Cumulative Weight Passing in %	Spec.Limits For Zone-II
10	0	0	0	100	100
4.75	84	8.40	8.40	91.6	90-100
2.36	122	12.20	20.60	79.4	75-100
1.18	189	18.90	39.50	60.5	55-90
600 Micron	156	15.60	55.10	44.9	35-59
300 Micron	225	22.50	77.60	22.4	8-30
150 Micron	136	13.60	91.20	8.8	0-10

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Job No.: CACE/BBMP/SS/W.No.14/2021-22

Date : 27.01.2022

TEST REPORT ON COARSE AGGREGATES

Client : **Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.

Agency : **Sri. Shivalingaiah Satish,** Contractor, Bangalore.

Name of Work : Improvements to drains and Providing Asphalting to roads at Bhuvaneshwari Nagara 9th and 10th Main Surroundings in Ward No.14 Bagalagunte, BBMP, Bangalore.

Date of Testing : 27.01.2022

IS Code : IS 383:2016

: IS 2386 (Part 1):1963(RA 2011)

Material : 20mm Aggregates

Total Wt. of Aggregates in gms= **5000**

Is Sieve Size in mm	Weight Retained (gm)	Retained Weight in %	Cumulative Retained Weight in %	Cumulative Weight Passing in %	Spec.Limits
40	0	0	0	100	100
20	188	3.8	3.8	96.2	95-100
10	2436	48.7	52.5	47.5	25-55
4.75	1958	39.2	91.6	8.4	0-10

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Job No.: CACE/BBMP/SS/W.No.14/2021-22

Date : 27.01.2022

TEST REPORT ON COARSE AGGREGATES

Client : Assistant Executive Engineer, Dasarahalli Sub Division, BBMP, Bangalore.
Agency : Sri. Shivalingaiah Satish, Contractor, Bangalore.
Name of Work : Improvements to drains and Providing Asphalting to roads at Bhuvaneshwari Nagara 9th and 10th Main Surroundings in Ward No.14 Bagalagunte, BBMP, Bangalore.
Date of Testing : 27.01.2022
IS Code : IS 383:2016
: IS 2386 (Part 1):1963(RA 2011)
Material : 40mm Aggregates

Total Wt. of Aggregates in gms 15000

Is Sieve Size in mm	Weight Retained (gm)	Retained Weight in %	Cumulative Retained Weight in %	Cumulative Weight Passing in %	Spec.Limits
80	0	0	0	100	100
40	174	1.16	1.16	98.84	95-100
20	8265	55.10	56.26	43.74	30-70
10	3268	21.79	78.05	21.95	10-35
4.75	2810	18.73	96.78	3.22	0-5

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Job No.: CACE/BBMP/SS/W.No.14/2021-22

Date : 27.01.2022

TEST REPORT ON FINE AGGREGATES (SAND)
IS 2116-1980

Client : **Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.
Agency : **Sri. Shivalingaiah Satish,** Contractor, Bangalore.
Name of Work : Improvements to drains and Providing Asphalting to roads at Bhuvaneshwari Nagara 9th and 10th Main Surroundings in Ward No.14 Bagalagunte, BBMP, Bangalore.
Date of Testing : 27.01.2022
Material : Sand - Masonry

Total wt. of aggregates in gms = **1000**

Is Sieve Size in mm	Weight Retained (gm)	Retained Weight in %	Cumulative Retained Weight in %	Cumulative Weight Passing in %	Spec.Limits as per IS 2116-1980
4.75	0	0.00	0.00	100.0	100
2.36	12	1.20	1.20	98.8	90-100
1.18	39	3.90	5.10	94.9	70-100
600 Micron	84	8.40	13.50	86.5	40-100
300 Micron	254	25.40	38.90	61.1	5-70
150 Micron	482	48.20	87.10	12.9	0-15

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Job No.: CACE/BBMP/SS/W.No.14/2021-22

Date : 02.02.2022

TEST REPORT OF PHYSICAL PROPERTIES OF REINFORCEMENT STEEL

Client : **Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.

Agency : **Sri. Shivalingaiah Satish,** Contractor, Bangalore.

Name of Work : Improvements to drains and Providing Asphalting to roads at Bhuvaneshwari Nagara 9th and 10th Main Surroundings in Ward No.14 Bagalagunte, BBMP, Bangalore.

Steel Dia/Length : 8mm,10mm,12mm " Fe500 TMT Bars"

Reference to BIS codes : IS 1786:2008(RA 2013) High Strength Deformed Steel Bars and Wires for Concrete Reinforcement-Specification

: IS 1608:2005 Metallic Materials- Tensile Testing at Ambient Temperature

Date of test : 02.02.2022

S.No	Brand	Nominal size (dia in mm)	Mass per meter (kg/meter)	TENSILE STRENGTH			
				0.20 % proof stress/ yield stress (N/mm^2)	Tensile strength (N/mm^2)	TS/YS ratio	Elongation, percent on gauge length
1	TMT	8	0.396	549	632	1.15	13
2	TMT	10	0.618	556	645	1.16	14
3	TMT	12	0.888	568	662	1.17	15.5

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Job No.: CACE/BBMP/SS/W.No.14/2021-22

Date: 13.02.2022

TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

Client	: **Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.
Agency	: **Sri. Shivalingaiah Satish,** Contractor, Bangalore.
Name of the work	: Improvements to drains and Providing Asphalting to roads at Bhuvaneshwari Nagara 9^{th} and 10^{th} Main Surroundings in Ward No.14 Bagalagunte, BBMP, Bangalore.
Sample ID	: Cement Concrete
Size of cubes	: 150mmx150mmx150mm
Cross Sectional Area	: 22500 mm^2
Technical Reference	: IS: 516-1959 (Reaffirmed 2008)
Grade of Concrete	: M_{20}
Compressive Strength as on	: 7th day

Sl.No.	Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	08.02.2022	13.02.2022	8.136	336.3	14.95
2	08.02.2022	13.02.2022	8.155	342.5	15.22
3	08.02.2022	13.02.2022	8.149	358.0	15.91

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Job No.: CACE/BBMP/SS/W.No.14/2021-22

Date: 08.03.2022

TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

Client	: **Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.
Agency	: **Sri. Shivalingaiah Satish,** Contractor, Bangalore.
Name of the work	: Improvements to drains and Providing Asphalting to roads at Bhuvaneshwari Nagara 9^{th} and 10^{th} Main Surroundings in Ward No.14 Bagalagunte, BBMP, Bangalore.
Sample ID	: Cement Concrete
Size of cubes	: 150mmx150mmx150mm
Cross Sectional Area	: 22500 mm^2
Technical Reference	: IS: 516-1959 (Reaffirmed 2008)
Grade of Concrete	: M_{20}
Compressive Strength as on	: 28th day

Sl.No.	Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	08.02.2022	08.03.2022	8.184	502.2	22.32
2	08.02.2022	08.03.2022	8.159	513.6	22.83
3	08.02.2022	08.03.2022	8.138	488.6	21.72

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Job No.: CACE/BBMP/SS/W.No.14/2021-22

Date: 13.02.2022

TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

Client	: **Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.
Agency	: **Sri. Shivalingaiah Satish,** Contractor, Bangalore.
Name of the work	: Improvements to drains and Providing Asphalting to roads at Bhuvaneshwari Nagara 9th and 10th Main Surroundings in Ward No.14 Bagalagunte, BBMP, Bangalore.
Sample ID	: Cement Concrete
Size of cubes	: 150mmx150mmx150mm
Cross Sectional Area	: 22500 mm^2
Technical Reference	: IS: 516-1959 (Reaffirmed 2008)
Grade of Concrete	: M_{20}
Compressive Strength as on	: 7th day

Sl.No.	Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	08.02.2022	13.02.2022	8.184	356.3	15.84
2	08.02.2022	13.02.2022	8.190	332.3	14.77
3	08.02.2022	13.02.2022	8.152	345.8	15.37

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Job No.: CACE/BBMP/SS/W.No.14/2021-22

Date: 08.03.2022

TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

Client	: **Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.
Agency	: **Sri. Shivalingaiah Satish,** Contractor, Bangalore.
Name of the work	: Improvements to drains and Providing Asphalting to roads at Bhuvaneshwari Nagara 9th and 10th Main Surroundings in Ward No.14 Bagalagunte, BBMP, Bangalore.
Sample ID	: Cement Concrete
Size of cubes	: 150mmx150mmx150mm
Cross Sectional Area	: 22500 mm^2
Technical Reference	: IS: 516-1959 (Reaffirmed 2008)
Grade of Concrete	: M_{20}
Compressive Strength as on	: 28th day

Sl.No.	Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	08.02.2022	08.03.2022	8.198	500.2	22.23
2	08.02.2022	08.03.2022	8.156	484.6	21.54
3	08.02.2022	08.03.2022	8.134	496.2	22.05

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For CIVIL AIM CONSULTANTS & ENGINEERS

Srikanth

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MEMBER OF MULTILATERAL RECOGNITION ARRANGEMENT IAF

Job No.: CACE/BBMP/SS/W.No.14/2021-22

Date: 18.02.2022

TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

Client	: **Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.
Agency	: **Sri. Shivalingaiah Satish,** Contractor, Bangalore.
Name of the work	: Improvements to drains and Providing Asphalting to roads at Bhuvaneshwari Nagara 9th and 10th Main Surroundings in Ward No.14 Bagalagunte, BBMP, Bangalore.
Sample ID	: Cement Concrete
Size of cubes	: 150mmx150mmx150mm
Cross Sectional Area	: 22500 mm^2
Technical Reference	: IS: 516-1959 (Reaffirmed 2008)
Grade of Concrete	: M_{20}
Compressive Strength as on	: 7th day

Sl.No.	Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	11.02.2022	18.02.2022	8.184	326.3	14.50
2	11.02.2022	18.02.2022	8.136	345.5	15.36
3	11.02.2022	18.02.2022	8.159	340.9	15.15

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Job No.: CACE/BBMP/SS/W.No.14/2021-22

Date: 08.03.2022

TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

Client	: **Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.
Agency	: **Sri. Shivalingaiah Satish,** Contractor, Bangalore.
Name of the work	: Improvements to drains and Providing Asphalting to roads at Bhuvaneshwari Nagara 9th and 10th Main Surroundings in Ward No.14 Bagalagunte, BBMP, Bangalore.
Sample ID	: Cement Concrete
Size of cubes	: 150mmx150mmx150mm
Cross Sectional Area	: 22500 mm^2
Technical Reference	: IS: 516-1959 (Reaffirmed 2008)
Grade of Concrete	: M_{20}
Compressive Strength as on	: 28th day

Sl.No.	Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	11.02.2022	08.03.2022	8.138	526.3	23.39
2	11.02.2022	08.03.2022	8.184	505.2	22.45
3	11.02.2022	08.03.2022	8.149	511.2	22.72

Note:

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Job No.: CACE/BBMP/SS/W.No.14/2021-22

Date: 18.02.2022

TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

Client	: **Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.
Agency	: **Sri. Shivalingaiah Satish,** Contractor, Bangalore.
Name of the work	: Improvements to drains and Providing Asphalting to roads at Bhuvaneshwari Nagara 9th and 10th Main Surroundings in Ward No.14 Bagalagunte, BBMP, Bangalore.
Sample ID	: Cement Concrete
Size of cubes	: 150mmx150mmx150mm
Cross Sectional Area	: 22500 mm^2
Technical Reference	: IS: 516-1959 (Reaffirmed 2008)
Grade of Concrete	: M_{20}
Compressive Strength as on	: 7th day

Sl.No.	Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	11.02.2022	18.02.2022	8.174	326.3	14.50
2	11.02.2022	18.02.2022	8.156	335.8	14.92
3	11.02.2022	18.02.2022	8.138	346.5	15.40

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Job No.: CACE/BBMP/SS/W.No.14/2021-22 Date: 08.03.2022

TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

Client : **Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.

Agency : **Sri. Shivalingaiah Satish,** Contractor, Bangalore.

Name of the work : Improvements to drains and Providing Asphalting to roads at Bhuvaneshwari Nagara 9th and 10th Main Surroundings in Ward No.14 Bagalagunte, BBMP, Bangalore.

Sample ID : Cement Concrete

Size of cubes : 150mmx150mmx150mm

Cross Sectional Area : 22500 mm^2

Technical Reference : IS: 516-1959 (Reaffirmed 2008)

Grade of Concrete : M_{20}

Compressive Strength as on : 28th day

Sl.No.	Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	11.02.2022	08.03.2022	8.184	512.2	22.76
2	11.02.2022	08.03.2022	8.169	508.3	22.59
3	11.02.2022	08.03.2022	8.154	477.5	21.22

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Job No.: CACE/BBMP/SS/W.No.14/2021-22

Date: 18.02.2022

TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

Client	: **Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.
Agency	: **Sri. Shivalingaiah Satish,** Contractor, Bangalore.
Name of the work	: Improvements to drains and Providing Asphalting to roads at Bhuvaneshwari Nagara 9th and 10th Main Surroundings in Ward No.14 Bagalagunte, BBMP, Bangalore.
Sample ID	: Cement Concrete
Size of cubes	: 150mmx150mmx150mm
Cross Sectional Area	: 22500 mm^2
Technical Reference	: IS: 516-1959 (Reaffirmed 2008)
Grade of Concrete	: M_{20}
Compressive Strength as on	: 7th day

Sl.No.	Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	11.02.2022	18.02.2022	8.166	356.9	15.86
2	11.02.2022	18.02.2022	8.184	332.3	14.77
3	11.02.2022	18.02.2022	8.152	342.8	15.24

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Job No.: CACE/BBMP/SS/W.No.14/2021-22

Date: 08.03.2022

TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

Client	: **Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.
Agency	: **Sri. Shivalingaiah Satish,** Contractor, Bangalore.
Name of the work	: Improvements to drains and Providing Asphalting to roads at Bhuvaneshwari Nagara 9th and 10th Main Surroundings in Ward No.14 Bagalagunte, BBMP, Bangalore.
Sample ID	: Cement Concrete
Size of cubes	: 150mmx150mmx150mm
Cross Sectional Area	: 22500 mm^2
Technical Reference	: IS: 516-1959 (Reaffirmed 2008)
Grade of Concrete	: M_{20}
Compressive Strength as on	: 28th day

Sl.No.	Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	11.02.2022	08.03.2022	8.190	500.2	22.23
2	11.02.2022	08.03.2022	8.155	484.6	21.54
3	11.02.2022	08.03.2022	8.172	496.2	22.05

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Job No.: CACE/BBMP/SS/W.No.14/2021-22

Date: 14.03.2022

TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

Client	: **Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.
Agency	: **Sri. Shivalingaiah Satish,** Contractor, Bangalore.
Name of the work	: Improvements to drains and Providing Asphalting to roads at Bhuvaneshwari Nagara 9th and 10th Main Surroundings in Ward No.14 Bagalagunte, BBMP, Bangalore.
Sample ID	: Cement Concrete
Size of cubes	: 150mmx150mmx150mm
Cross Sectional Area	: 22500 mm^2
Technical Reference	: IS: 516-1959 (Reaffirmed 2008)
Grade of Concrete	: M_{20}
Compressive Strength as on	: 28th day

Sl.No.	Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	17.02.2022	14.03.2022	8.174	502.2	22.32
2	17.02.2022	14.03.2022	8.166	519.3	23.08
3	17.02.2022	14.03.2022	8.159	484.6	21.54

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Job No.: CACE/BBMP/SS/W.No.14/2021-22 Date: 24.02.2022

TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

Client	: **Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.
Agency	: **Sri. Shivalingaiah Satish,** Contractor, Bangalore.
Name of the work	: Improvements to drains and Providing Asphalting to roads at Bhuvaneshwari Nagara 9th and 10th Main Surroundings in Ward No.14 Bagalagunte, BBMP, Bangalore.
Sample ID	: Cement Concrete
Size of cubes	: 150mmx150mmx150mm
Cross Sectional Area	: 22500 mm^2
Technical Reference	: IS: 516-1959 (Reaffirmed 2008)
Grade of Concrete	: M_{20}
Compressive Strength as on	: 7th day

Sl.No.	Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	17.02.2022	24.02.2022	8.184	332.3	14.77
2	17.02.2022	24.02.2022	8.150	345.8	15.37
3	17.02.2022	24.02.2022	8.146	356.9	15.86

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Job No.: CACE/BBMP/SS/W.No.14/2021-22 Date: 24.02.2022

TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

Client	: **Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.
Agency	: **Sri. Shivalingaiah Satish,** Contractor, Bangalore.
Name of the work	: Improvements to drains and Providing Asphalting to roads at Bhuvaneshwari Nagara 9^{th} and 10^{th} Main Surroundings in Ward No.14 Bagalagunte, BBMP, Bangalore.
Sample ID	: Cement Concrete
Size of cubes	: 150mmx150mmx150mm
Cross Sectional Area	: 22500 mm^2
Technical Reference	: IS: 516-1959 (Reaffirmed 2008)
Grade of Concrete	: M_{20}
Compressive Strength as on	: 7th day

Sl.No.	Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	17.02.2022	24.02.2022	8.184	336.3	14.95
2	17.02.2022	24.02.2022	8.162	354.2	15.74
3	17.02.2022	24.02.2022	8.146	346.5	15.40

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Job No.: CACE/BBMP/SS/W.No.14/2021-22

Date: 14.03.2022

TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

Client	**: Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.
Agency	**: Sri. Shivalingaiah Satish,** Contractor, Bangalore.
Name of the work	: Improvements to drains and Providing Asphalting to roads at Bhuvaneshwari Nagara 9th and 10th Main Surroundings in Ward No.14 Bagalagunte, BBMP, Bangalore.
Sample ID	: Cement Concrete
Size of cubes	: 150mmx150mmx150mm
Cross Sectional Area	: 22500 mm^2
Technical Reference	: IS: 516-1959 (Reaffirmed 2008)
Grade of Concrete	: M_{20}
Compressive Strength as on	: 28th day

Sl.No.	Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	17.02.2022	14.03.2022	8.188	502.2	22.32
2	17.02.2022	14.03.2022	8.156	519.6	23.09
3	17.02.2022	14.03.2022	9.168	488.5	21.71

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For CIVIL AIM CONSULTANTS & ENGINEERS

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Job No.: CACE/BBMP/SS/W.No.14/2021-22

Date: 01.03.2022

TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

Client	: **Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.
Agency	: **Sri. Shivalingaiah Satish,** Contractor, Bangalore.
Name of the work	: Improvements to drains and Providing Asphalting to roads at Bhuvaneshwari Nagara 9th and 10th Main Surroundings in Ward No.14 Bagalagunte, BBMP, Bangalore.
Sample ID	: Cement Concrete
Size of cubes	: 150mmx150mmx150mm
Cross Sectional Area	: 22500 mm^2
Technical Reference	: IS: 516-1959 (Reaffirmed 2008)
Grade of Concrete	: M_{20}
Compressive Strength as on	: 7th day

Sl.No.	Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	22.02.2022	01.03.2022	8.198	336.3	14.95
2	22.02.2022	01.03.2022	8.165	345.5	15.36
3	22.02.2022	01.03.2022	8.146	352.8	15.68

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For CIVIL AIM CONSULTANTS & ENGINEERS

Vikanth
Authorised Signatory

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Date: 22.03.2022

Job No.: CACE/BBMP/SS/W.No.14/2021-22

TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

Client	: **Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.
Agency	: **Sri. Shivalingaiah Satish,** Contractor, Bangalore.
Name of the work	: Improvements to drains and Providing Asphalting to roads at Bhuvaneshwari Nagara 9th and 10th Main Surroundings in Ward No.14 Bagalagunte, BBMP, Bangalore.
Sample ID	: Cement Concrete
Size of cubes	: 150mmx150mmx150mm
Cross Sectional Area	: 22500 mm^2
Technical Reference	: IS: 516-1959 (Reaffirmed 2008)
Grade of Concrete	: M_{20}
Compressive Strength as on	: 28th day

Sl.No.	Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	22.02.2022	22.03.2022	8.136	501.2	22.28
2	22.02.2022	22.03.2022	8.168	476.9	21.20
3	22.02.2022	22.03.2022	8.145	495.4	22.02

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For CIVIL AIM CONSULTANTS & ENGINEERS

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Job No.: CACE/BBMP/SS/W.No.14/2021-22

Date: 01.03.2022

TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

Client	: **Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.
Agency	: **Sri. Shivalingaiah Satish,** Contractor, Bangalore.
Name of the work	: Improvements to drains and Providing Asphalting to roads at Bhuvaneshwari Nagara 9th and 10th Main Surroundings in Ward No.14 Bagalagunte, BBMP, Bangalore.
Sample ID	: Cement Concrete
Size of cubes	: 150mmx150mmx150mm
Cross Sectional Area	: 22500 mm^2
Technical Reference	: IS: 516-1959 (Reaffirmed 2008)
Grade of Concrete	: M_{20}
Compressive Strength as on	: 7th day

Sl.No.	Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	22.02.2022	01.03.2022	8.139	350.6	15.58
2	22.02.2022	01.03.2022	8.165	345.7	15.36
3	22.02.2022	01.03.2022	8.149	356.8	15.86

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Job No.: CACE/BBMP/SS/W.No.14/2021-22

Date: 01.03.2022

TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

Client	: **Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.
Agency	: **Sri. Shivalingaiah Satish,** Contractor, Bangalore.
Name of the work	: Improvements to drains and Providing Asphalting to roads at Bhuvaneshwari Nagara 9th and 10th Main Surroundings in Ward No.14 Bagalagunte, BBMP, Bangalore.
Sample ID	: Cement Concrete
Size of cubes	: 150mmx150mmx150mm
Cross Sectional Area	: 22500 mm^2
Technical Reference	: IS: 516-1959 (Reaffirmed 2008)
Grade of Concrete	: M_{20}
Compressive Strength as on	: 7th day

Sl.No.	Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	22.02.2022	01.03.2022	8.139	336.3	14.95
2	22.02.2022	01.03.2022	9.140	362.5	16.11
3	22.02.2022	01.03.2022	9.146	346.5	15.40

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Job No.: CACE/BBMP/SS/W.No.14/2021-22

Date: 04.03.2022

PRECAST SLAB 100mm Thick(CORE) TEST REPORT

Client	:	**Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.
Contractor	:	**Sri. Shivalingaiah Satish,** Contractor, Bangalore.
Name of Work	:	Improvements to drains and Providing Asphalting to roads at Bhuvaneshwari Nagara 9th and 10th Main Surroundings in Ward No.14 Bagalagunte, BBMP, Bangalore.
No.of Sample Tested	:	03
Date of Testing	:	04.03.2022
Techinical Reference	:	IS:516-1959 (Reaffirmed 1999), SP-24:1983.
Grade of Concrete	:	M_{20}

Sl. No.	Dia of Core D (mm)	Height of Core H (mm)	Core Wt (Kg)	Density of Core (kg / m^3)	H / D	Correction factor (Based on H/D)	Failure Load (kN)	Core Strength (N/mm^2)	Correction Factor for the Dia. (Strength of the Core x 1.08)	Corrected Cylinder Compressive Strength (N/mm^2)	Equivalent Cube Compressive Strength (N/mm^2)
1	50.00	80.00	0.365	2323.66	1.60	0.957	32.60	16.60	17.93	17.16	21.45
2	50.00	82.00	0.379	2353.94	1.64	0.961	33.20	16.91	18.26	17.55	21.94
3	50.00	84.00	0.392	2376.71	1.68	0.965	33.90	17.27	18.65	18.00	22.50

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Job No.: CACE/BBMP/SS/W.No.14/2022-23

Date : 12.04.2022

GRADATION FOR WMM

Client : **Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.

Agency : **Sri. Shivalingaiah Satish,** Contractor, Bangalore.

Name of Work : Improvements to drains and Providing Asphalting to roads at Bhuvaneshwari Nagara 9th and 10th Main Surroundings in Ward No.14 Bagalagunte, BBMP, Bangalore.

IS Code: : IS 2386 (Part 1):1963(RA 2011)

Date of Testing : 12.04.2022

Material Type : Wet Mix Macadam

Oven Dry.Wt, grar 10000

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Requirement as per MORTH 5th edition table no 400.13
53	0	0	0	100	100
45	182	182	1.8	98.2	95-100
22.4	2536	2718	27.2	72.8	60-80
11.2	2150	4868	48.7	51.3	40-60
4.75	1865	6733	67.3	32.7	25-40
2.36	1160	7893	78.9	21.1	15-30
0.600	589	8482	84.8	15.2	8-22
0.075	1210	9692	96.9	3.1	0-5

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Job No.: CACE/BBMP/SS/W.No.14/2022-23 Date : 14.04.2022

ATTERBERG LIMITS TEST FOR WMM

Client	: **Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.
Agency	: **Sri. Shivalingaiah Satish,** Contractor, Bangalore.
Name of Work	: Improvements to drains and Providing Asphalting to roads at Bhuvaneshwari Nagara 9th and 10th Main Surroundings in Ward No.14 Bagalagunte, BBMP, Bangalore.
IS Code:	: IS 2720(Part 5):1985
Date of Testing	12.04.2022 to 14.04.2022
Material Type	: Wet Mix Macadam

Sl. No.	Particulars	Test Results	Requirement as per MORTH 5th edition Cl.406.2.1.2
1	Liquid Limit	19.50	-
2	Plasticity Index, %	Non Plastic	6.0% Maximum.

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Job No.: CACE/BBMP/SS/W.No.14/2022-23

Date: 25.04.2022

Aggregate Gradation Test

Client	Assistant Executive Engineer, Dasarahalli Sub Division, BBMP, Bangalore.
Agency	Sri. Shivalingaiah Satish, Contractor, Bangalore.
Name of the Work	Improvements to drains and Providing Asphalting to roads at Bhuvaneshwari Nagara 9th and 10th Main Surroundings in Ward No.14 Bagalagunte, BBMP, Bangalore.
BIS Code	IS 2386(Part 1):1963(RA 2011)
Sample I / D	Hot mix Plant, Bangalore.
Type of Mix	Dense Graded Bituminous Macadam
Date of Testing	25.04.2022

Total Weight of Sample: 10000 gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Requirement as per MORTH table 500.10	Remarks
37.50	0	0.0	0	100	100	Gradation satisfies Grade-II MORTH specification
26.50	716	7.2	7.16	92.84	90 - 100	
19.00	1256	12.6	19.72	80.28	71 - 95	
13.20	1380	13.8	33.52	66.48	56 - 80	
4.75	2515	25.2	58.67	41.33	38 - 54	
2.36	1086	10.9	69.53	30.47	28 - 42	
0.300	1315	13.2	82.68	17.32	7 - 21	
0.075	1150	11.5	94.18	5.82	2 - 8	

Total Weight of Sample: 10000 gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Requirement as per MORTH table 500.10	Remarks
37.5	0	0.0	0	100	100	Gradation satisfies Grade-II MORTH specification
26.5	681	6.8	6.81	93.19	90 - 100	
19	1425	14.3	21.06	78.94	71 - 95	
13.2	1153	11.5	32.59	67.41	56 - 80	
4.75	2415	24.2	56.74	43.26	38 - 54	
2.360	1162	11.6	68.36	31.64	28 - 42	
0.300	1325	13.3	81.61	18.39	7 - 21	
0.075	1158	11.6	93.19	6.81	2 - 8	

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JobNo: CACE/BBMP/SS/W.No.14/2022-23 Date : 25.04.2022

TEST RESULTS OF AGGREGATE SHAPE TEST
(Flakiness & Elongation)

Client : **Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.

Agency : **Sri. Shivalingaiah Satish,** Contractor, Bangalore.

Name of work : Improvements to drains and Providing Asphalting to roads at Bhuvaneshwari Nagara 9th and 10th Main Surroundings in Ward No.14 Bagalagunte, BBMP, Bangalore.

BIS Code : IS 2386 Part (1):1963

Date of Test : 25.04.2022

Type of Mix : Dense Graded Bituminous Macadam

Sl.No.	Flakiness Index Value(%)	Elongation Index Value(%)	Total(Combined Flakiness and Elongation)(%)	Requirements
1	11.60	13.90	25.50	Maximum allowable Combined Flakiness and Elongation Indices for Dense Graded Bituminous Macadam is 35% as per Table 500.8 MORTH Specification.
2	12.10	14.20	26.30	

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Job No: CACE/BBMP/SS/W.No.14/2022-23

Date : 25.04.2022

TEST RESULTS OF AGGREGATE IMPACT VALUE

Client	: **Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.
Agency	: **Sri. Shivalingaiah Satish,** Contractor, Bangalore.
Name of work	: Improvements to drains and Providing Asphalting to roads at Bhuvaneshwari Nagara 9th and 10th Main Surroundings in Ward No.14 Bagalagunte, BBMP, Bangalore.
Source / Location	: Hot Mix Plant, Bangalore
BIS Code	: IS 2386 Part (4):1963
Type of Mix	: Dense Graded Bituminous Macadam
Date of test	: 25.04.2022

Sl No.	Details	Trial No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W1 g	380	382	
2	Weight of agregate passing 2.36 mm sieve after the test = W2 g	84	86	
3	Weight of aggregate retained 2.36 mm sieve after the test = W3 g	296	297	
5	Aggregate Impact value = percent fines 100* (W2/W1) percent	22.11	22.38	22.24

Comments:
→ Maximum allowable Aggregate Impact value for Dense Graded Bituminous Macadam is 27% (Table 500-8 of MORTH specification)

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Job No: CACE/BBMP/SS/W.No.14/2022-23

Date: 25.04.2022

TEST REPORT ON PAVING BITUMEN

Client	**Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.
Agency	**Sri. Shivalingaiah Satish,** Contractor, Bangalore.
Name of work	Improvements to drains and Providing Asphalting to roads at Bhuvaneshwari Nagara 9th and 10th Main Surroundings in Ward No.14 Bagalagunte, BBMP, Bangalore.
BIS Code	IS 73:2013,IS 1203:1978, IS 1208:1978, IS 1205:1978, IS1448(P-69):1969
Date of Testing	**25.04.2022**
Type of Mix	**Dense Graded Bituminous Macadam , VG 30**
Source of Location	**Hot Mix Plant**

The results of the tests conducted on the bitumen sample using for Dense Graded Bituminous Macadam

Sl.No	Description	Test Result	Requirement as per IS:73:2013
1	Penetration at 25 0C, 100gms, 5sec, 1/10 mm	49	Min 45
2	Softening point, 0C	51	Min 47
3	Ductility at 250C, cm	99	Min40
4	Flash Point, 0C	282	Min 220

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Date: 27.04.2022

Job No.: CACE/BBMP/SS/W.No.14/2022-23

Specific Gravity And Water Absorption Test

Client	**Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.
Agency	**Sri. Shivalingaiah Satish,** Contractor, Bangalore.
Name of the Work	Improvements to drains and Providing Asphalting to roads at Bhuvaneshwari Nagara 9th and 10th Main Surroundings in Ward No.14 Bagalagunte, BBMP, Bangalore.
BIS Code	IS 2386(Part 3):1963
Type of Mix	Dense Graded Bituminous Macadam
Date of Testing	25.04.2022 to 27.04.2022

Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 3	
			2021	2023	2025	
1	Weight of aggregate suspended in water with the basket	W_1 g	754	754	754	
2	Weight of basket suspended in water	W_2 g	1267	1269	1271	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_s$ g	2016	2018	2020	
4	Weight of saturated surface dry aggregate in air	W_3 g	749	749	749	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_S)$ g	2009	2010	2011	
6	Weight of oven dried aggregate	W_4 g	2.682	2.684	2.685	2.684
7	Specific Gravity	$W_4/(W_3-W_S)$	2.708	2.713	2.718	2.713
8	Apparent Specific gravity	$W_4/(W_4-W_S)$	0.35%	0.40%	0.45%	0.40%
9	Water Absorption	$((W_3-W_4)*100)/W_4$				

Comments:

→ Maximum allowable Aggregate Water absorption value for Dense Graded Bituminous Macadam is 2.0%(As per MORTH table 500.8)

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Job No.: CACE/BBMP/SS/W.No.14/2022-23 Date: 04.05.2022

TEST REPORT ON STABILITY OF MIX

Client	:	**Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.
Agency	:	**Sri. Shivalingaiah Satish,** Contractor, Bangalore.
Name of the Work	:	Improvements to drains and Providing Asphalting to roads at Bhuvaneshwari Nagara 9th and 10th Main Surroundings in Ward No.14 Bagalagunte, BBMP, Bangalore.
Type of Mix	:	Dense Graded Bituminous Macadam
Date of Testing	:	04.05.2022

The results of the tests conducted on the Dense Graded Bituminous Macadam mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-19)
1	Marshal Stability, Kn	9.72	10.13	9 Kn (min)
2	Marshal flow, mm	2.58	3.44	2 – 4
3	Percent air voids in Mineral Aggregate	13.61	14.29	13 – 15
4	Voids in Compacted Mix	3.82	4.65	3 – 6
5	Percent Voids filled with Bitumen	68.90	69.51	65 - 75
6	Density, g/cc	2.25	2.27	--

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Ramaiah Layout, Nagasandra, Bangalore - 560 073.
Ph: 9591618639, GSTIN: 29CNWPD9510K1ZB, Email: civilaimconsultants@gmail.com

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Job No.: CACE/BBMP/SS/W.No.14/2021-22 Date : 26.04.2022

Aggregate Gradation Test
IS : 2386 Part I

Client	**Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.
Agency	**Sri. Shivalingaiah Satish,** Contractor, Bangalore.
Name of the Work	Improvements to drains and Providing Asphalting to roads at Bhuvaneshwari Nagara 9th and 10th Main Surroundings in Ward No.14 Bagalagunte, BBMP, Bangalore.
BIS Code	IS 2386(Part 1):1963
Sample I / D	Hot Mix Plant, Bangalore
Type of Mix	Bituminous Concrete
Date of Testing	26.04.2022

Total Weight of Sample: **5000** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Requirement as per MORTH table 500.17	Remarks
19	0	0	0	100	100	Gradation satisfies Bituminous concrete Grade-II specification as per MORTH
13.2	410	8.20	8.20	91.80	90 - 100	
9.5	489	9.78	17.98	82.02	70 - 88	
4.75	635	12.70	30.68	69.32	53 - 71	
2.36	682	13.64	44.32	55.68	42 - 58	
1.18	520	10.40	54.72	45.28	34 - 48	
0.600	546	10.92	65.64	34.36	26 - 38	
0.300	489	9.78	75.42	24.58	18 - 28	
0.150	355	7.10	82.52	17.48	12 - 20	
0.075	482	9.64	92.16	7.84	4 - 10	

Total Weight of Sample: **5000** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Requirement as per MORTH table 500.17	Remarks
19	0	0	0	100	100	Gradation satisfies Bituminous concrete Grade-II specification as per MORTH
13.2	420	8.40	8.40	91.60	90 - 100	
9.5	549	10.98	19.38	80.62	70 - 88	
4.75	682	13.64	33.02	66.98	53 - 71	
2.36	533	10.66	43.68	56.32	42 - 58	
1.18	556	11.12	54.80	45.20	34 - 48	
0.600	542	10.84	65.64	34.36	26 - 38	
0.300	689	13.78	79.42	20.58	18 - 28	
0.150	185	3.70	83.12	16.88	12 - 20	
0.075	485	9.70	92.82	7.18	4 - 10	

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Ramaiah Layout, Nagasandra, Bangalore - 560 073.
Ph: 9591618639, GSTIN: 29CNWPD9510K1ZB, Email: civilaimconsultants@gmail.com

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Job No.: CACE/BBMP/SS/W.No.14/2022-23 Date: 26.04.2022

Aggregate Impact Value

Client	**Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.
Agency	**Sri. Shivalingaiah Satish,** Contractor, Bangalore.
Name of the Work	Improvements to drains and Providing Asphalting to roads at Bhuvaneshwari Nagara 9th and 10th Main Surroundings in Ward No.14 Bagalagunte, BBMP, Bangalore.
BIS Code	IS 2386(Part 4):1963
Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Bituminous Concrete
Date of Testing	26.04.2022

Sl No.	Details	Test No. 1	Test No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	381	383	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	84	86	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	297	297	
4	Aggregate Impact value = percent fines 100* (W_2/W_1) percent	22.05	22.45	22.25

Comments:
→ Maximum allowable Aggregate Impact value for Bituminous Concrete is 24%(MORTH table no.500.16)

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ದಾಸರಹಳ್ಳಿ ಉಪ ವಿಭಾಗ
ಬಾಗಲಗುಂಟೆ, ಬಿ.ಬಿ.ಎಂ.ಪಿ
ಬೆಂಗಳೂರು-560073

No. 01, Satvika Nilaya, Opp. Widia Poorna Prajna School,
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Job No.: CACE/BBMP/SS/W.No.14/2022-23

Date: 26.04.2022

TEST REPORT

Client	:	**Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.
Agency	:	**Sri. Shivalingaiah Satish,** Contractor, Bangalore.
Name of the work	:	Improvements to drains and Providing Asphalting to roads at Bhuvaneshwari Nagara 9th and 10th Main Surroundings in Ward No.14 Bagalagunte, BBMP, Bangalore.
IS Code	:	IS 73:2013, IS 1203:1978(RA 2008), IS 1205:1978(RA 2009), IS 1208:1978(RA 2009), IS 1209:1978(RA 2009)
Source of location	:	Hot mix Plant, Bangalore, VG 30
Date of testing	:	26.04.2022

The results of the tests conducted on the bitumen sample using for Bituminous Concrete

Sl. No	Description	Test Result	Requirement as per IS:73:2013
1	Penetration at 25 °C, 1/10 mm	48	Min 45
2	Softening point, °C	51	Min. 47
3	Ductility at 27°C, cm	> 100	Min. 40
4	Flash Point, °C	278	Min. 220

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ಉ. ದಾಸರಹಳ್ಳಿ ಉಪ ವಿಭಾಗ
ಬಾಗಲಗುಂಟೆ. ಬಿ.ಬಿ.ಎಂ.ಪಿ
ಬೆಂಗಳೂರು 560073

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Job No.: CACE/BBMP/SS/W.No.14/2021-22

Date : 26.04.2022

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	**Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.
Agency	**Sri. Shivalingaiah Satish,** Contractor, Bangalore.
Name of Work	Improvements to drains and Providing Asphalting to roads at Bhuvaneshwari Nagara 9th and 10th Main Surroundings in Ward No.14 Bagalagunte, BBMP,
Technical Reference	IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	Bituminous Concrete
Date of Testing	26.04.2022

Sl no	Test	1	2	Requirements as per MORTH 5th edition table no 500.16
1	Flakiness Index	10.9	11.2	Combined Flakiness & Elongation index Max 35%
2	Elongation Index	12.6	12.9	
	Combined Flakiness & Elongation index	23.50	24.10	

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Authorised Signatory

No. 01, Satvika Nilaya, Opp. Widia Poorna Prajna School,
Ramaiah Layout, Nagasandra, Bangalore - 560 073.
Ph: 9591618639, GSTIN: 29CNWPD9510K1ZB, Email: civilaimconsultants@gmail.com

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Job No.: CACE/BBMP/SS/W.No.14/2022-23

Date : 28.04.2022

Specific Gravity And Water Absorption Test

Client	**Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.
Agency	**Sri. Shivalingaiah Satish,** Contractor, Bangalore.
Name of the Work	Improvements to drains and Providing Asphalting to roads at Bhuvaneshwari Nagara 9th and 10th Main Surroundings in Ward No.14 Bagalagunte, BBMP, Bangalore.
BIS Code	IS 2386(Part 3):1963
Type of Mix	Bituminous Concrete
Date of Testing	26.04.2022 to 28.04.2022

Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 3	
1	Weight of aggregate suspended in water with the basket	W_1 g	2022	2024	2026	
2	Weight of basket suspended in water	W_2 g	755	755	755	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_s$ g	1267	1269	1271	
4	Weight of saturated surface dry aggregate in air	W_3 g	2016	2018	2020	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_S)$ g	749	749	749	
6	Weight of oven dried aggregate	W_4 g	2008	2009	2010	
7	Specific Gravity	$W_4/(W_3-W_S)$	2.681	2.682	2.684	2.682
8	Apparent Specific gravity	$W_4/(W_4-W_S)$	2.710	2.715	2.720	2.715
9	Water Absorption	$((W_3-W_4)*100)/W_4$	0.40%	0.45%	0.50%	0.45%

Comments:

→ Maximum allowable Aggregate Water absorption value for Bituminous Concrete is 2.0%(MORTH table 500.16)

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Job No.: CACE/BBMP/SS/W.No.14/2022-23 Date: 05.05.2022

TEST REPORT ON STABILITY OF MIX

Client	:	**Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.
Agency	:	**Sri. Shivalingaiah Satish,** Contractor, Bangalore.
Name of the Work	:	Improvements to drains and Providing Asphalting to roads at Bhuvaneshwari Nagara 9th and 10th Main Surroundings in Ward No.14 Bagalagunte, BBMP, Bangalore.
Source of location	:	Hot mix Plant, Bangalore
Type of Mix	:	Bituminous Concrete
Date of Testing	:	05.05.2022

The results of the tests conducted on the Bituminous Concrete mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-19)
1	Marshal Stability, Kn	9.45	10.21	9 Kn (min)
2	Marshal flow, mm	2.89	3.62	2 – 4
3	Percent air voids in Mineral Aggregate	13.84	14.12	13 – 15
4	Voids in Compacted Mix	3.56	4.58	3 – 6
5	Percent Voids filled with Bitumen	71.24	72.65	65 - 75
6	Density, g/cc	2.25	2.26	--

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Job No.: CACE/BBMP/SS/W.No.14/2022-23 Date : 05.05.2022

BITUMEN CONTENT AND GRADATION DETERMINATION OF BITUMINOUS CONCRETE

AASHTO T 164 & AASHTO T 30

CLIENT	Assistant Executive Engineer, Dasarahalli Sub Division, BBMP, Bangalore.
AGENCY	Sri. Shivalingaiah Satish, Contractor, Bangalore.
NAME OF THE WORK	Improvements to drains and Providing Asphalting to roads at Bhuvaneshwari Nagara 9th and 10th Main Surroundings in Ward No.14 Bagalagunte, BBMP, Bangalore.
SAMPLE ID	Hot Mix Plant, Bangalore
DATE OF TESTING	05.05.2022

BITUMEN CONTENT DETERMINATION

Description	Sample 1	Sample 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	473	472.5
3. Weight of Asphalt and Mineral matter Extracted, g	27	27.5
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g	-	-
6. Weight of Bitumen Extracted, g. (corrected)	27	27.5
7. Bitumen content in %	5.40	5.50
8. Average	5.45	

GRADATION AFTER EXTRACTION

SIEVE SIZE	Test 1				Requirement as per MORTH table 500.17
mm	Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	
19	0	0	0	100	100
13.2	14.2	14.2	3.0	97.0	90 - 100
9.5	62.3	76.5	16.2	83.8	70 - 88
4.75	90.8	167.3	35.4	64.6	53 - 71
2.36	46.5	213.8	45.2	54.8	42 - 58
1.18	35.6	249.4	52.7	47.3	34 - 48
0.600	53.2	302.6	64.0	36.0	26 - 38
0.300	42.8	345.4	73.0	27.0	18 - 28
0.150	39.6	385	81.4	18.6	12 - 20
0.075	51.2	436.2	92.2	7.8	4 - 10

SIEVE SIZE	Test 2				Requirement as per MORTH table 500.17
mm	Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	
19	0	0	0	100	100
13.2	13.8	13.8	2.9	97.1	90 - 100
9.5	65.2	79	16.7	83.3	70 - 88
4.75	92.4	171.4	36.3	63.7	53 - 71
2.36	46.5	217.9	46.1	53.9	42 - 58
1.18	42.8	260.7	55.2	44.8	34 - 48
0.600	59.3	320	67.7	32.3	26 - 38
0.300	42.6	362.6	76.7	23.3	18 - 28
0.150	38.5	401.1	84.9	15.1	12 - 20
0.075	41.2	442.3	93.6	6.4	4 - 10

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